

Application of Advanced Electromagnetic Arrays to High Efficiency, High Bandwidth, Redundant Linear Actuators, Phase I

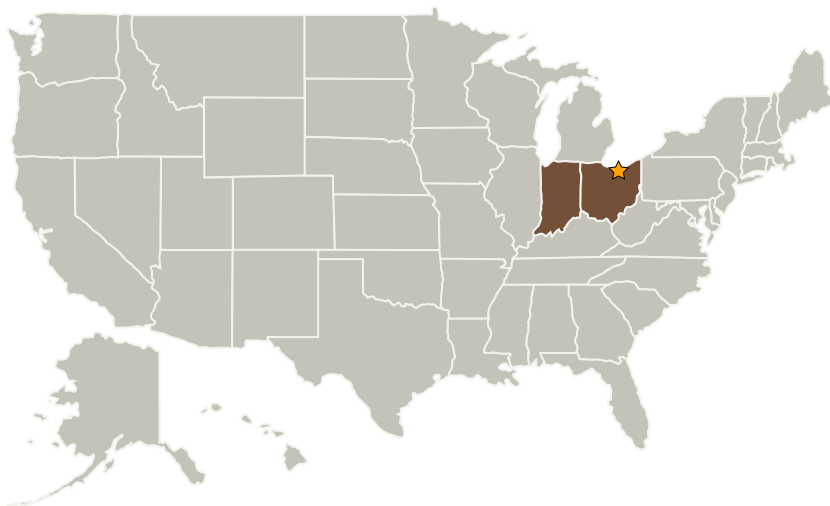
Completed Technology Project (2005 - 2005)



Project Introduction

The proposed SBIR effort will employ a systems approach to develop motor/controller/screw element systems adequate for demanding launch thrust vector control and control surface actuator applications. This approach will utilize high bandwidth, high efficiency, redundant motor systems coupled with appropriately paired motor controls. The actuator system will consist of a high efficiency permanent magnet motor with a high number of current channels for system redundancy, an H-bridge based controller with a high number of parallel current channels and sufficient current capability to enable high system response, and conventional screw-based linear actuator elements. The linear actuation elements will be designed with corrosion resistance, increased resistance to nut jamming, and inherent features preventing incorrect installation of the device. These innovations are necessary to overcome the inherent limitations of today's actuator systems, which were developed based on the limitations of traditional motors, power electronics, and available actuator hardware. Phase I of this project will focus on the design requirements, key features, and suggested solutions for thrust vector control actuator systems. The Phase II portion of the project will deliver a working prototype actuator.

Primary U.S. Work Locations and Key Partners



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Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Glenn Research Center (GRC)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

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Organizations Performing Work	Role	Type	Location
★ Glenn Research Center(GRC)	Lead Organization	NASA Center	Cleveland, Ohio
Kinetic Art and Technology Corporation	Supporting Organization	Industry	Greenville, Indiana

Primary U.S. Work Locations	
Indiana	Ohio

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Project Manager:

Michael F O'brien

Principal Investigators:

Leland D Melvin

Craig Rutherford

Technology Areas

Primary:

- TX15 Flight Vehicle Systems
 - └ TX15.1 Aerosciences
 - └ TX15.1.3 Aeroelasticity